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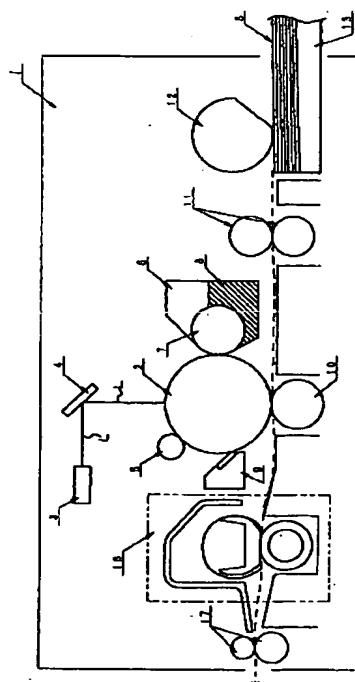
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(54)【発明の名称】 像加熱装置及び画像形成装置

(57)【要約】

【課題】 記録材がフィルムに巻付くことを防止し、容易にジャム処理できるようにした像加熱装置及び画像形成装置を提供すること。

【解決手段】 ステイ33に支持され、回転可能な円筒状のフィルム34を介して記録材Sを加熱する加熱ユニット31と、該加熱ユニット31とニップ部36を形成し記録材Sを加圧する加圧部材32とを有し、記録材Sを該ニップ部36で挟持してフィルム34の回転と共に搬送させることにより記録材上の画像を加熱処理する像加熱装置において、前記ニップ部36よりもフィルム回転方向下流側のフィルム近傍に分離爪41を備え、該分離爪41の分離面41aを延長した際のフィルム34との交点を接点○とした該フィルム34の接線mと該分離面41aとのなす角度が0°～60°の間となるように構成したこと。



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【特許請求の範囲】

【請求項1】ステイに支持され、回転可能な円筒状のフィルムを介して記録材を加熱する加熱ユニットと、該加熱ユニットとニップ部を形成し記録材を加圧する加圧部材とを有し、記録材を該ニップ部で挟持してフィルムの回転と共に搬送されることにより記録材上の画像を加熱処理する像加熱装置において、

前記ニップ部よりもフィルム回転方向下流側のフィルム近傍に分離爪を備え、該分離爪の分離面を延長した際のフィルムとの交点を接点とした該フィルムの接線と該分離面とのなす角度が 0° ～ 60° の間となるように構成したことを特徴とする像加熱装置。

【請求項2】前記分離爪の分離面が、フィルムに巻付きはじめた記録材と当接して、該記録材を該フィルムから離間する方向へ案内して分離させる面であることを特徴とする請求項1に記載の像加熱装置。

【請求項3】前記ニップ部のフィルム回転方向下流側に分離変曲部を設け、該変曲部よりも下流側に前記分離爪を配置したことを特徴とする請求項1又は2に記載の像加熱装置。

【請求項4】前記ニップ部のフィルム回転方向下流側に分離変曲部を設け、該変曲部よりも下流側に2次分離変曲部を設け、該2次分離変曲部の下流側に前記分離爪を配置したことを特徴とする請求項1又は2に記載の像加熱装置。

【請求項5】ステイに支持され、回転可能な円筒状のフィルムを介して記録材を加熱する加熱ユニットと、該加熱ユニットとニップ部を形成し記録材を加圧する加圧部材とを有し、記録材を該ニップ部で挟持してフィルムの回転と共に搬送されることにより記録材上の画像を加熱処理する像加熱装置において、

前記ニップ部よりもフィルム回転方向下流側でフィルムと接した分離爪を備え、該分離爪とフィルムの接している部分を接点とした該フィルムの接線と該分離面とのなす角度が 0° ～ 60° の間となるように構成したことを特徴とする像加熱装置。

【請求項6】前記分離爪の分離面が、フィルムに巻付きはじめた記録材と当接し、該記録材をフィルムから離間する方向へ案内して分離させる面であることを特徴とする請求項6に記載の像加熱装置。

【請求項7】前記ニップ部のフィルム回転方向下流側に分離変曲部を設け、該変曲部よりも下流側に前記分離爪を配置したことを特徴とする請求項5又は6に記載の像加熱装置。

【請求項8】前記ニップ部のフィルム回転方向下流側に分離変曲部を設け、該変曲部よりも下流側に2次分離変曲部を設け、該2次分離変曲部の下流側に前記分離爪を配置したことを特徴とする請求項5又は6に記載の像加熱装置。

【請求項9】前記分離爪が自重又は弾性部材により一 50

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定力にてフィルムと接していることを特徴とする請求項5乃至8の何れか1項に記載の像加熱装置。

【請求項10】前記分離爪が前記フィルムのたるみ部上に当接していることを特徴とする請求項5乃至9の何れか1項に記載の像加熱装置。

【請求項11】前記加熱処理が、記録材上の画像を該記録材に熱定着させる処理であることを特徴とする請求項1乃至10の何れか1項に記載の像加熱装置。

【請求項12】記録材上に画像を形成する像形成手段と、該記録材上の画像を加熱する像加熱手段とを有する画像形成装置において、

像加熱手段として請求項1乃至11の何れか1項に記載の像加熱装置を備えたことを特徴とする画像形成装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、像加熱装置及びそれを備えた画像形成装置に関するものであり、例えば、電子写真技術を用いた複写機、プリンタ、ファクシミリ装置等の記録シートに画像を定着させるために、薄耐熱フィルムを使用した定着装置を装備する画像形成装置に関するものである。

【0002】

【従来の技術】薄耐熱フィルムを使用した定着装置は、図2に示すように加熱ユニット31と加圧ローラ32にてニップ部36を形成し、該ニップ部36に通紙された記録シートSを加熱及び加圧して該シート上の画像を定着させる。

【0003】該装置においては、加熱ユニット31のステイ33のニップ部下流側に、記録シートSの幅方向に連続してなる半円状の変曲部を備え、薄耐熱フィルム34の曲率を部分的に大きくすることでニップ部を通過した記録シートSを薄耐熱フィルム34から分離している。また、ユーザーが直接、加熱ユニット31および加圧ローラ32に触れることを防止するために定着器カバー35を備えている。

【0004】従来、図3に示すように、何らかの原因でジャムが発生し、記録シートSが定着器カバー35内でアコードィオン状態になると、記録シートSの後端側の行き場が狭められ、記録シートSと薄耐熱フィルム34の分離ができなくなってしまい、薄耐熱フィルム34と記録シートSがトナーを介して密着したまま薄耐熱フィルム34が回転し、再度ニップ部36に記録シートSが入り込むことがあった。すると、記録シートSの後端と再度ニップ部36に入り込んだ部分が図4のようにトナーにより接着され、ジャム処理が非常に困難となる。

【0005】そのため、加熱ユニット31の下流側と定着器カバー35の下流側の壁との隙間tを狭くして記録シートSの薄耐熱フィルム34への巻付きを防止している。

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【発明が解決しようとする課題】しかしながら、記録シートS上の印字濃度が高くなると薄耐熱フィルム34と記録シートSとが分離し難くなる傾向にあり、薄耐熱フィルム34と定着器カバー35の隙間tを接するまで狭くして記録シートSの巻き込みを防止していくても、図5のように薄耐熱フィルム34が定着器カバーと隙間を作る方向に逃げて記録シートSが隙間tを通過し、図10の如くループ状に接着されてしまうことがあった。

【0007】本発明は上記問題を解決するためになされたものであり、記録材がフィルムに巻付くことを防止し、容易にジャム処理できるようにした像加熱装置及び画像形成装置の提供を目的としている。

【0008】

【課題を解決するための手段】本発明の像加熱装置及び画像形成装置は、上記課題を解決するために下記の構成を特徴とするものである。

【0009】〔1〕：ステイに支持され、回転可能な円筒状のフィルムを介して記録材を加熱する加熱ユニットと、該加熱ユニットとニップ部を形成し記録材を加圧する加圧部材とを有し、記録材を該ニップ部で挟持してフィルムの回転と共に搬送させることにより記録材上の画像を加熱処理する像加熱装置において、前記ニップ部よりもフィルム回転方向下流側のフィルム近傍に分離爪を備え、該分離爪の分離面を延長した際のフィルムとの交点を接点とした該フィルムの接線と該分離面とのなす角度が 0° ～ 60° の間となるように構成したことを特徴とする像加熱装置。

【0010】〔2〕：前記分離爪の分離面が、フィルムに巻付きはじめた記録材と当接して、該記録材を該フィルムから離間する方向へ案内して分離させる面であることを特徴とする〔1〕に記載の像加熱装置。

【0011】〔3〕：前記ニップ部のフィルム回転方向下流側に分離変曲部を設け、該変曲部よりも下流側に前記分離爪を配置したことを特徴とする〔1〕又は〔2〕に記載の像加熱装置。

【0012】〔4〕：前記ニップ部のフィルム回転方向下流側に分離変曲部を設け、該変曲部よりも下流側に2次分離変曲部を設け、該2次分離変曲部の下流側に前記分離爪を配置したことを特徴とする〔1〕又は〔2〕に記載の像加熱装置。

【0013】〔5〕：ステイに支持され、回転可能な円筒状のフィルムを介して記録材を加熱する加熱ユニットと、該加熱ユニットとニップ部を形成し記録材を加圧する加圧部材とを有し、記録材を該ニップ部で挟持してフィルムの回転と共に搬送させることにより記録材上の画像を加熱処理する像加熱装置において、前記ニップ部よりもフィルム回転方向下流側でフィルムと接した分離爪を備え、該分離爪とフィルムの接している部分を接点とした該フィルムの接線と該分離面とのなす角度が 0° ～ 60° の間となるように構成したことを特徴とする像加

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熱装置。

【0014】〔6〕：前記分離爪の分離面が、フィルムに巻付きはじめた記録材と当接し、該記録材をフィルムから離間する方向へ案内して分離させる面であることを特徴とする〔5〕に記載の像加熱装置。

【0015】〔7〕：前記ニップ部のフィルム回転方向下流側に分離変曲部を設け、該変曲部よりも下流側に前記分離爪を配置したことを特徴とする〔5〕又は〔6〕に記載の像加熱装置。

【0016】〔8〕：前記ニップ部のフィルム回転方向下流側に分離変曲部を設け、該変曲部よりも下流側に2次分離変曲部を設け、該2次分離変曲部の下流側に前記分離爪を配置したことを特徴とする〔5〕又は〔6〕に記載の像加熱装置。

【0017】〔9〕：前記分離爪が自重又は弾性部材により一定力にてフィルムと接していることを特徴とする〔5〕乃至〔8〕の何れか1項に記載の像加熱装置。

【0018】〔10〕：前記分離爪が前記フィルムのたるみ部上に当接していることを特徴とする〔5〕乃至〔9〕の何れか1項に記載の像加熱装置。

【0019】〔11〕：前記加熱処理が、記録材上の画像を該記録材に熱定着させる処理であることを特徴とする〔1〕乃至〔10〕の何れか1項に記載の像加熱装置。

【0020】〔12〕：記録材上に画像を形成する像形成手段と、該記録材上の画像を加熱する像加熱手段とを有する画像形成装置において、像加熱手段として〔1〕乃至〔11〕の何れか1項に記載の像加熱装置を備えたことを特徴とする画像形成装置。

【0021】〈作用〉上記のように、分離面と、この延長線とフィルムとの交点、又は分離爪とフィルムとの接点におけるフィルムの接線とのなす角度が 0° ～ 60° の間となるように分離爪を配置したことにより、フィルムに巻付き始めた記録材を該フィルムに力をかけずに分離できるため、薄耐熱フィルムに傷や過度の摩耗を生じさせることなく、記録材のフィルムへの巻付きを防止し、容易にジャム処理を行うことが可能になる。

【0022】

【発明の実施の形態】〈第1の実施形態〉以下に図面を参照して本発明を適用した像加熱装置及びこれを定着器として装備した画像形成装置について説明する。図1は該画像形成装置としての電子写真プリンタの概略構成を示す模式断面図である。

【0023】まず、図1を参照して電子写真プリンタの概略構成について説明する。図1に示すように電子写真プリンタ1は帯電ローラ5を用いて感光ドラム2表面の均一帯電を行う。次にレーザースキャナ3により、レーザ光を感光ドラム上にミラー4を介して照射し、目的画像をイメージ露光して潜像を形成する。

【0024】次に現像器6中のトナー8を感光ドラム面

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上に現像ローラ7を介して付与することで上記潜像を現像し、トナー像とする。一方、給紙トレイ13に積載された記録シート(記録材)Sは給紙ローラ12と分離パッドにより1枚ずつ給紙され、搬送ローラ対11に送られる。記録シートSは搬送ローラ対11から転写ローラ10と感光ドラム2との対向部(転写ニップ部)に送られ、転写ローラ10から転写バイアスが印加されて感光ドラム面上のトナー像が記録シートS上に転写される。記録シートSに転移したトナー8は定着器16によって定着され、記録シートSは排紙ローラ対17によって電子写真プリンタ本体外に排出される。一方感光ドラム2は、転写後残留しているトナー8がクリーナー9によってクリーニングされ次段のプロセスへと移行する。

【0025】次に定着器部分について説明する。図5は本発明の本実施形態例の定着部の模式断面図である。同図中、Hは通電により発熱する平面状のヒータ(本例ではセラミックヒータ)、34は該ヒータHと摺接する円筒状の薄耐熱フィルム、33は加熱面を下向きにして該ヒータHを支持すると共に薄耐熱フィルム34を回転可能に支持する支持部材(ステイ)であり、これらの要素H、33、34により本例の加熱ユニット31を構成している。また、32は該加熱ユニット31と圧接してニップ部36を形成する加圧部材(加圧ローラ)である。該加圧ローラ32は不図示の駆動手段に駆動されて矢示aの反時計方向に回転駆動され、これに伴いフィルム34を矢示a'方向に従動させる。

【0026】而して、前述の感光ドラム2、レーザースキャナ3、現像器6、転写ローラ10等からなる像形成手段により、トナー像が形成された記録シートSが、ニップ部36に導入されると、加圧ローラ32の回転によって搬送され、フィルム34を介したヒータHからの熱とニップ圧とでトナー像が記録シートSに熱定着される。

【0027】このような構成において、何らかの原因で記録シートSが排紙ローラ対17から先に搬送されなくなると、定着器カバー35内で、かつ、排紙ローラ対17とニップ部36間で、記録シートSがアコーディオン状になって行き、記録シートSの行き場が狭まってくる。そして更に記録シートSが搬送されると分離変曲部37で記録シートSと薄耐熱フィルム34が分離されず、トナーを介して記録シートSが薄耐熱フィルム34に密着し巻付きはじめてしまう。

【0028】そこで本実施形態では、ニップ部36よりフィルム回転方向下流側のフィルム近傍に分離爪41を設け、この分離面41aが巻付いた記録シートSと当たって該記録シートSをフィルム34から離間する方向へ案内して分離させている。

【0029】分離した記録シートSは図6のように分離爪41と定着器カバー35とのポケット部に滞留し、行き場のなくなった記録シートSは更に小さなアコーディ

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オン状態になり、加熱ユニット31と加圧ローラ32の隙間に蓄積されるか、記録シートSの搬送スペースがなくなるため薄耐熱フィルム34がスリップし、記録シートSの搬送が止まる。

【0030】該分離爪41は、薄耐熱フィルム34に接することなく、かつフィルム34の回転軸と直交する面内(即ち図5紙面内)において薄耐熱フィルム34と分離面41aを延長した際の交点を接点oとした接線mと分離面41aとのなす角度θが0°～60°の間となるように配置されている。

【0031】また、分離爪41は薄耐熱フィルム近傍に1カ所以上、好ましくは図9のようにフィルム幅方向に並べて4カ所に配置する。

【0032】以上のように本実施形態によれば、分離面41aと、この延長線とフィルム34との交点oにおけるフィルム34の接線mとのなす角度が0°～60°の間となるように分離爪41を配置したことにより、薄耐熱フィルム34に巻付き始めた記録シートSを該薄耐熱フィルム34に力をかけずに分離できるため、薄耐熱フィルム34に傷や過度の摩耗を生じさせることなく、記録シートSの薄耐熱フィルム34への巻付きを防止し、ユーザーが手順通りジャム処理を行うことが可能になる。

【0033】〈第2の実施形態〉次に第2の実施形態を図7に基づいて説明する。図7は本発明に係る第2の実施形態の定着器付近の模式断面図である。本実施形態は前述の実施形態と比べ、2次分離変曲部の下流側に分離爪を設けた点が異なり、その他の構成は同一である。このため、同一の要素には同符号を付すなどして再度の説明を一部省略した。

【0034】何らかの原因で記録シートSが排紙ローラ対17から先に搬送されなくなると、定着器カバー35内で、かつ、排紙ローラ対17とニップ部36間で、排紙ローラ対17側から記録シートSがアコーディオン状になって行き、記録シートSの行き場が狭まってくる。更に記録シートSが搬送されると、薄耐熱フィルム34を支持し、形状を規制しているステイ33のニップ部36下流側に紙幅方向に連続してなる半円状の変曲部に規制されてなる薄耐熱フィルム34の分離変曲部37で記録シートSと薄耐熱フィルム34が分離されず、トナーを介して記録シートSが薄耐熱フィルム34に密着し巻付きはじめてしまう。

【0035】そこで、本実施形態では、薄耐熱フィルム34を支持し、形状を規制しているステイ33に紙幅方向に連続してなる半円状の2次変曲部により規制されてなる薄耐熱フィルム34の2次分離変曲部38を前記分離変曲部37のフィルム回転方向下流側に設け、該分離変曲部37を通過してしまった記録シートSを薄耐熱フィルム34から分離させはじめ、この更に下流側に配置した分離爪41で完全に分離させている。分離された記

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録シートSは図8のように分離爪部に滞留し、行き場のなくなった記録シートSは更に小さなアコードィオン状態になり、加熱ユニット31と加圧ローラ32の隙間に蓄積されるか、記録シートSの搬送スペースがなくなるため薄耐熱フィルム34がスリップし、記録シートSの搬送が止まる。

【0036】本実施形態においても分離爪41は、薄耐熱フィルム34に接することなく、かつ薄耐熱フィルム34と分離面41aを延長した際の交点を接点とした接線mと分離爪41の分離面41aとのなす角度θが0°～60°の間となるように配置されている。また、分離爪41は薄耐熱フィルム上に2カ所以上配置されている。

【0037】以上のように本実施形態によれば、2次分離変曲部の下流側に薄耐熱フィルム34に近接させて分離爪41を設け、該分離爪41の分離面41aと接線mとのなす角度が0°～60°の間となるように構成したことにより、薄耐熱フィルム34に力をかけずにすむため、薄耐熱フィルム34に傷や過度の摩耗を生じさせることなく、薄耐熱フィルム34に巻付きはじめた記録シートSを確実に分離でき、ユーザーが手順通りジャム処理を行うことが可能になる。

【0038】(第3の実施形態) 次に第3の実施形態を図11に基づいて説明する。図11は本発明に係る第3の実施形態の定着器付近の模式断面図である。本実施形態は前述の実施形態と比べ、分離爪をフィルムのたるみ部に当接させた点が異なり、その他の構成は同一である。このため、同一の要素には同符番を付すなどして再度の説明を一部省略した。

【0039】何らかの原因で記録シートSが排紙ローラ対17から先に搬送されなくなると、定着器カバー35内で、かつ、排紙ローラ対17とニップ部36間で、排紙ローラ対17側から記録シートSがアコードィオン状になって行き、記録シートSの行き場が狭まってくる。更に記録シートSが搬送されると、薄耐熱フィルム34を支持し、形状を規制しているステイ33のニップ部36下流側に紙幅方向に連続してなる半円状の変曲部に規制されてなる薄耐熱フィルム34の分離変曲部37で記録シートSと薄耐熱フィルム34が分離されず、トナーを介して記録シートSが薄耐熱フィルム34に密着し巻付きはじめてしまう。

【0040】巻付きはじめた記録シートSは、薄耐熱フィルム34のステイ33とのたるみ部分(フィルム34がステイ33から浮いている部分)に当接力5g/cm以上で接し、かつフィルム回転軸と直交する面内(即ち図11紙面内)において分離爪先端と薄耐熱フィルム34の接している部分を接点oとしたフィルム34の接線mと分離面41aとのなす角度θが0°～60°の間で配置された分離爪41により薄耐熱フィルム34と記録シートSは分離される。分離された記録シートSは図1 50

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2のように分離爪41と定着器カバー35とのポケット部に記録シートSが滞留し、行き場のなくなった記録シートSは更に小さなアコードィオン状態になり、加熱ユニット31と加圧ローラ32の隙間に蓄積されるか、記録シートSの搬送スペースがなくなるため薄耐熱フィルム34がスリップし、記録シートSの搬送が止まる。

【0041】なお、分離爪41は薄耐熱フィルム上に1カ所以上、好ましくはフィルム回転軸方向に並べて複数ヶ所に配置する。

【0042】以上のように本実施例によれば、分離爪41が薄耐熱フィルム34のたるみ部分上に当接力5g/cm以上で接し、この接点oにおける接線mと分離爪41の分離面41aとのなす角度が0°～60°の間となるように該分離爪41を配置したことにより、薄耐熱フィルム34に無理な力をかけずにすむため、該薄耐熱フィルム34に傷や過度の摩耗を生じさせることなく、薄耐熱フィルム34への記録シートSの巻付きを防止し、ユーザーが手順通りジャム処理を行うことが可能になる。

【0043】

【発明の効果】以上説明したように本発明によれば、記録材がフィルムに巻付くことを防止し、容易にジャム処理できるようにした像加熱装置及び画像形成装置を提供することができる。

【図面の簡単な説明】

【図1】 電子写真プリンタの概略構成を示す模式側断面図

【図2】 従来例の模式側断面図

【図3】 加熱ユニットに記録シートが巻付いたところの模式側断面図

【図4】 薄耐熱フィルムを変形させて記録シートが巻付きはじめたところの模式断面図

【図5】 本発明の第1の実施形態に係る模式側断面図

【図6】 本発明の第1の実施形態に係る模式側断面図

【図7】 本発明の第2の実施形態に係る模式側断面図

【図8】 本発明の第2の実施形態に係る模式側断面図

【図9】 本発明の分離爪のフィルム長手方向(記録材幅方向)の配置を示す概略図

【図10】 巷付いた記録シート上のトナーと定着前の記録シート上のトナーが接着した状態の説明図

【図11】 本発明の第3の実施形態に係る模式側断面図

【図12】 本発明の第3の実施形態に係る模式側断面図

【符号の説明】

1	電子写真プリンタ
2	感光ドラム
3	レーザースキャナ
4	ミラー
5	帶電ローラ

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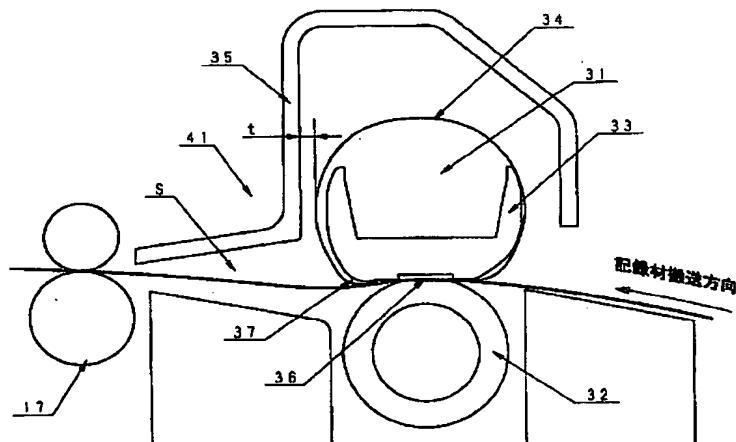
9

6 現像器
7 現像ローラ
8 トナー
9 クリーナー
10 転写ローラ
11 搬送ローラ対
12 給紙ローラ
13 給紙トレイ
16 定着器
17 排紙ローラ対
31 加熱ユニット
32 加圧ローラ
33 ステイ

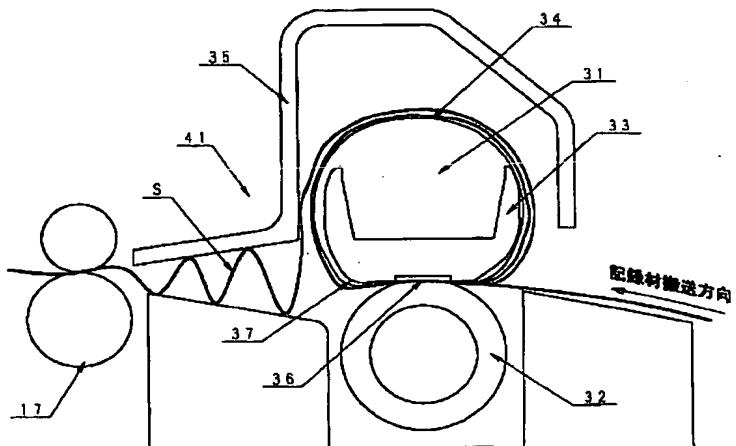
34 薄耐熱フィルム
35 定着器カバー
36 ニップ部
37 分離変曲部
38 2次分離変曲部
41 分離爪
41a 分離面
H ヒータ
L レーザ光
S 記録シート
m 接線
o 接点
θ 接線と分離爪の分離面との角度

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【図2】

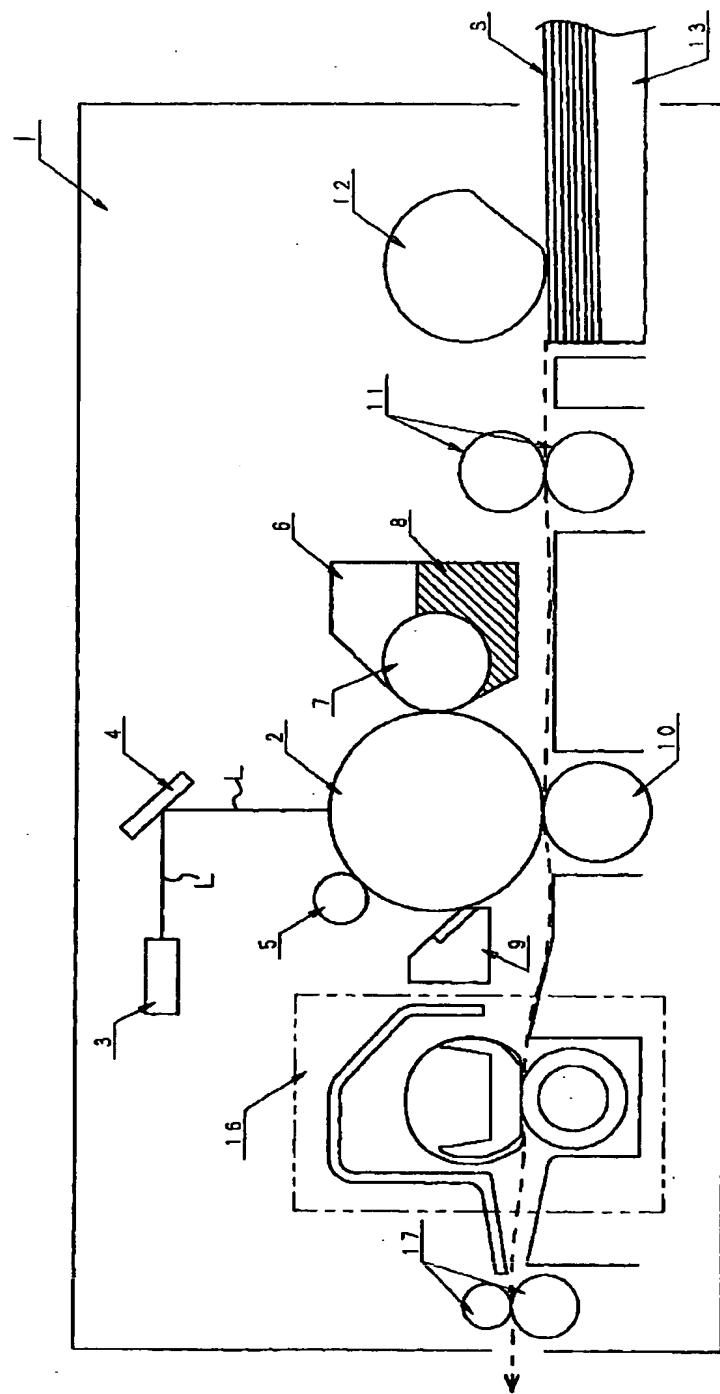


【図3】



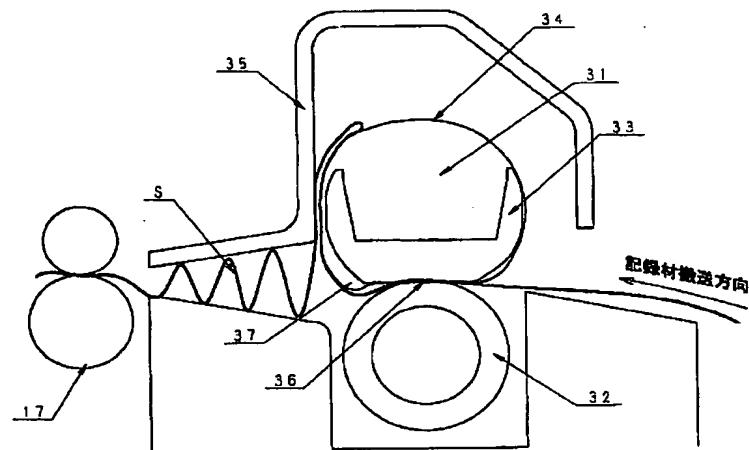
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【図1】

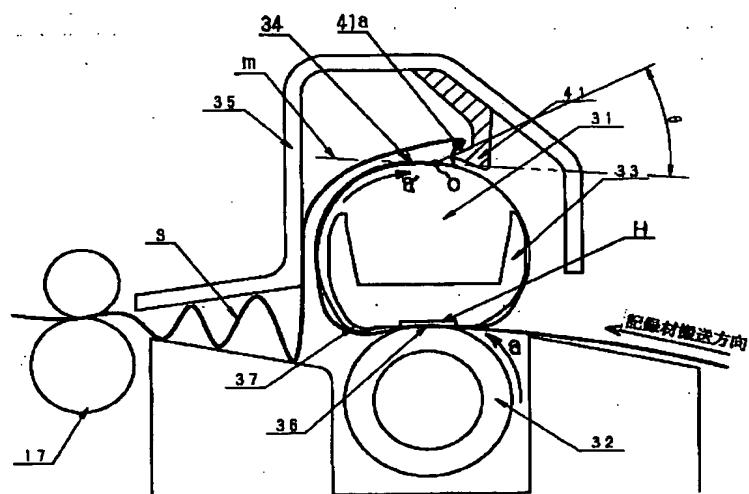


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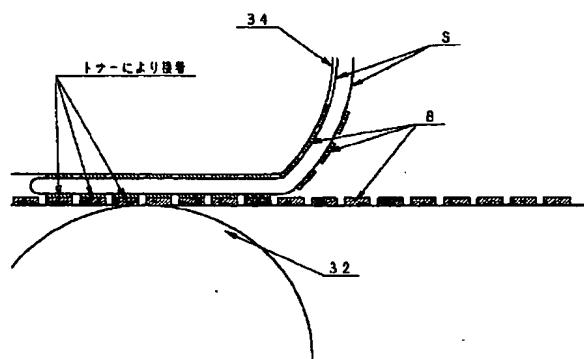
【図4】



【図5】

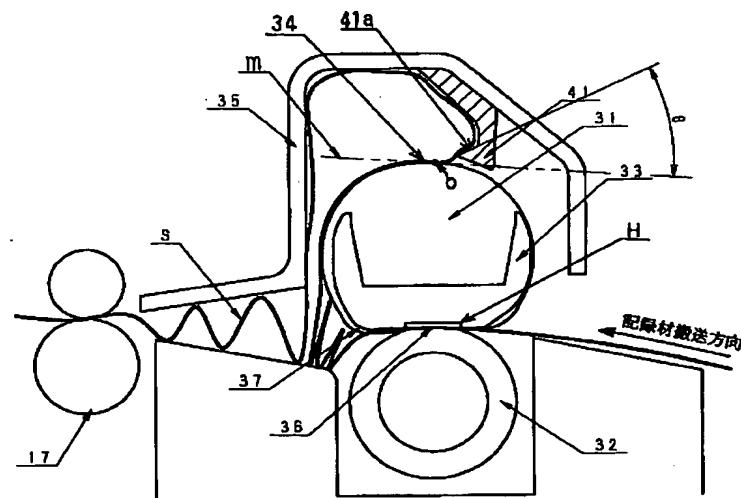


【図10】

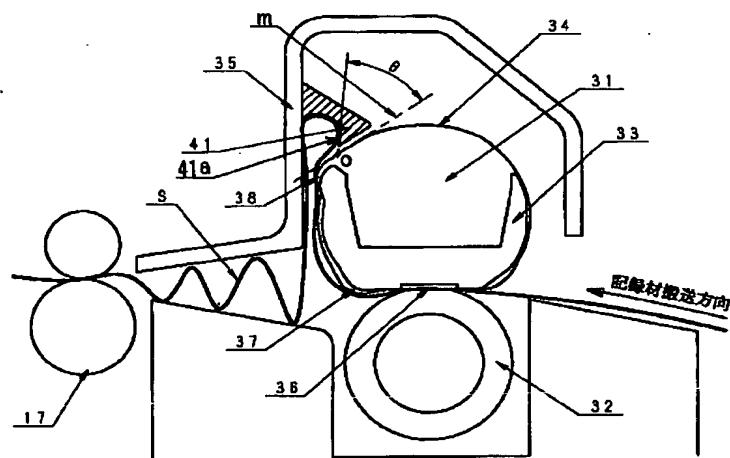


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【図6】



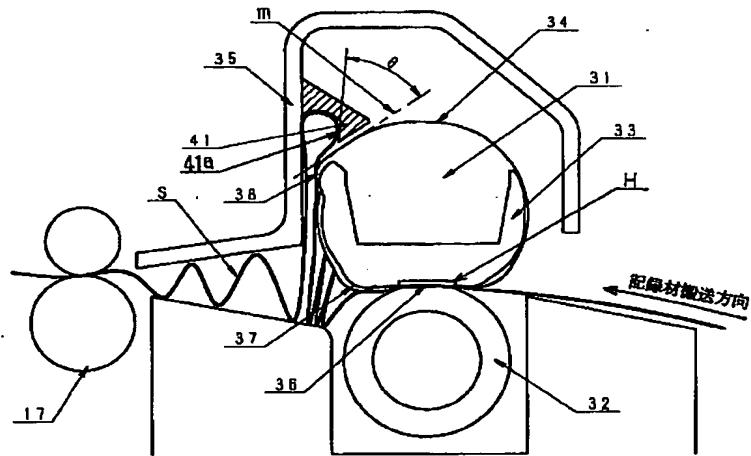
【図7】



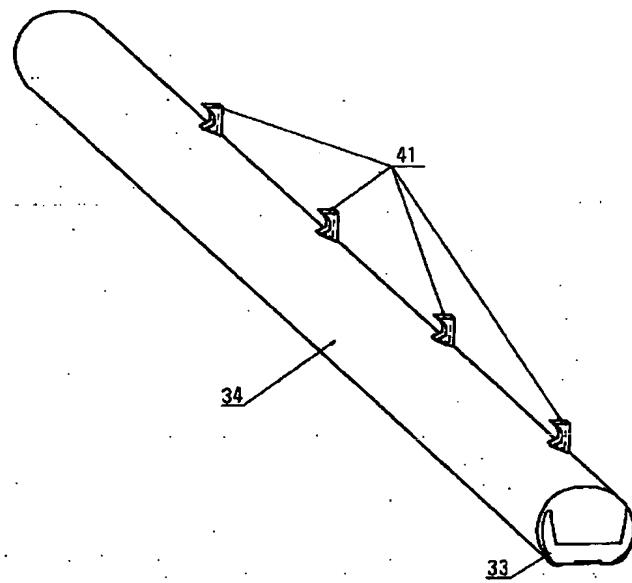
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【図8】

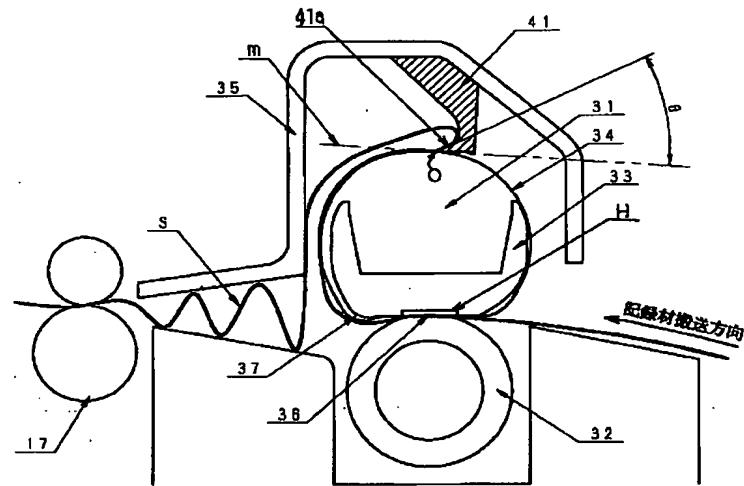


【図9】



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【図11】



【図12】

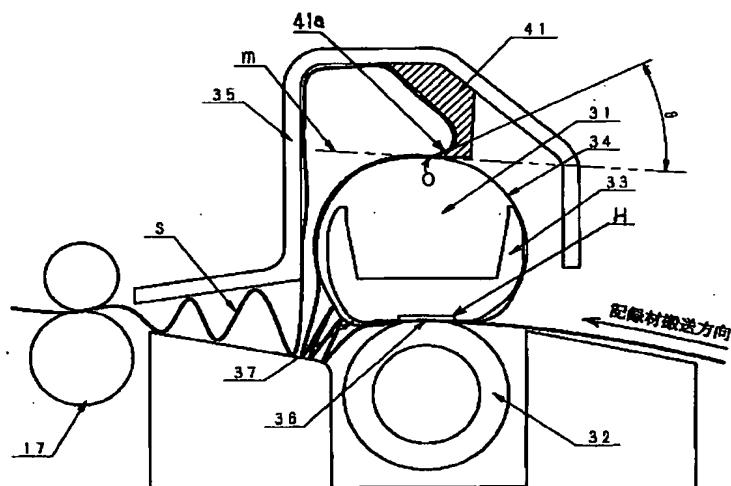


IMAGE-HEATING DEVICE AND IMAGE-FORMING DEVICE

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Inventor(s): TANAKA NORIAKI; NIIMURA TAKESHI
TAKESHI
Applicant(s): CANON INC
Requested Patent: JP2001092280
Application Number: JP19990267003 19990921
Priority Number(s):
IPC Classification: G03G15/20
EC Classification:
Equivalents:

Abstract

PROBLEM TO BE SOLVED: To provide an image-heating device and an image-forming device, constituted so that recording material is prevented from being wound round film, and jamming processing is easily performed.

SOLUTION: This image-heating device is provided with a heating unit 31 supported by a stay 33 and heating the recording material S via the rotatable cylindrical film 34, and a pressure member 32 forming a nip part 36 with the unit 31 and depressing the recording material S. In the device, the recording material S is held in the nip part 36 and carried with the rotation of the film 34, so as to heat the image on the recording material. Then, the device is equipped with a separation pawl 41 near the film on a lower downstream side in a film rotating direction than the nip part 36, and an angle formed by the tangent (m) of the film 34 in a state, where the intersection point of the film 34 with the extension of the separation surface 41a of the pawl 41 is set as a contact point (o) with the separation surface 41a being set at 0 deg. to 60 deg..

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PATENT ABSTRACTS OF JAPAN

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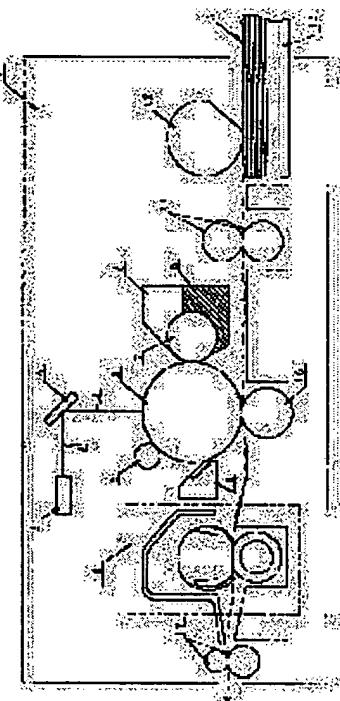
(21)Application number : 11-267003 (71)Applicant : CANON INC
 (22)Date of filing : 21.09.1999 (72)Inventor : TANAKA NORIAKI
 NIIMURA TAKESHI

(54) IMAGE-HEATING DEVICE AND IMAGE-FORMING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an image-heating device and an image-forming device, constituted so that recording material is prevented from being wound round film, and jamming processing is easily performed.

SOLUTION: This image-heating device is provided with a heating unit 31 supported by a stay 33 and heating the recording material S via the rotatable cylindrical film 34, and a pressure member 32 forming a nip part 36 with the unit 31 and depressing the recording material S. In the device, the recording material S is held in the nip part 36 and carried with the rotation of the film 34, so as to heat the image on the recording material. Then, the device is equipped with a separation pawl 41 near the film on a lower downstream side in a film rotating direction than the nip part 36, and an angle formed by the tangent (m) of the film 34 in a state, where the intersection point of the film 34 with the extension of the separation surface 41a of the pawl 41 is set as a contact point (o) with the separation surface 41a being set at 0° to 60°.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

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CLAIMS

[Claim(s)]

[Claim 1] In image heating apparatus which heat-treats an image on record material by having the following, pinching record material in this nip section, and making it convey with rotation of a film Image heating apparatus which is equipped with a separation pawl near the film of the film hand-of-cut downstream rather than said nip section, and is characterized by constituting so that it may become while an angle of a tangent of this film and this separation side which used an intersection with a film at the time of extending a separation side of this separation pawl as a contact to make is 0 degree - 60 degrees. A heating unit which is supported by stay and heats record material through a film of the shape of a pivotable cylinder A pressurization member which forms this heating unit and the nip section and pressurizes record material

[Claim 2] Image heating apparatus according to claim 1 characterized by a separation side of said separation pawl being a field made to guide and separate in the direction which contacts a film with ***** material in the beginning with a volume, and estranges this record material from this film.

[Claim 3] Image heating apparatus according to claim 1 or 2 characterized by having prepared the separation inflection section in the film hand-of-cut downstream of said nip section, and having arranged said separation pawl to the downstream rather than this inflection section.

[Claim 4] Image heating apparatus according to claim 1 or 2 characterized by having prepared the separation inflection section in the film hand-of-cut downstream of said nip section, having prepared the secondary segregation inflection section in the downstream rather than this inflection section, and having arranged said separation pawl to the downstream of this secondary segregation inflection section.

[Claim 5] In image heating apparatus which heat-treats an image on record material by having the following, pinching record material in this nip section, and making it convey with rotation of a film Image heating apparatus which is equipped with a separation pawl which touched a film by the film hand-of-cut downstream rather than said nip section, and is characterized by constituting so that it may become while an angle of a tangent of this film and this separation side which used as a contact a portion to which a film is in contact with this separation pawl to make is 0 degree - 60 degrees. A heating unit which is supported by stay and heats record material through a film of the shape of a pivotable cylinder A pressurization member which forms this heating unit and the nip section and pressurizes record material

[Claim 6] Image heating apparatus according to claim 6 characterized by a separation side of said separation pawl being a field made to guide and separate in the direction which contacts a film with ***** material in the beginning with a volume, and estranges this record material from a film.

[Claim 7] Image heating apparatus according to claim 5 or 6 characterized by having prepared the separation inflection section in the film hand-of-cut downstream of said nip section, and having arranged said separation pawl to the downstream rather than this inflection section.

[Claim 8] Image heating apparatus according to claim 5 or 6 characterized by having prepared the separation inflection section in the film hand-of-cut downstream of said nip section, having prepared the secondary segregation inflection section in the downstream rather than this inflection section, and having arranged said separation pawl to the downstream of this secondary segregation inflection section.

[Claim 9] Image heating apparatus given in claim 5 characterized by said separation pawl being in contact with a film by fixed force with a self-weight or an elastic member thru/or any 1 term of 8.

[Claim 10] Image heating apparatus given in claim 5 characterized by said separation pawl having contacted on the sag section of said film thru/or any 1 term of 9.

[Claim 11] Image heating apparatus given in claim 1 characterized by said heat-treatment being the processing which makes this record material carry out heat fixing of the image on record material thru/or any 1 term of 10.

[Claim 12] Image formation equipment characterized by equipping claim 1 thru/or any 1 term of 11 with image heating

apparatus of a publication as an image heating means in image formation equipment which has an image formation means to form an image on record material, and an image heating means to heat an image on this record material.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention relates to the image formation equipment equipped with the anchorage device which used the thin heatproof film in order to fix an image to record sheets, such as a copying machine using [for example,] electrophotographic technology, a printer, and facsimile apparatus, about image formation equipment equipped with image heating apparatus and it.

[0002]

[Description of the Prior Art] The anchorage device which used the thin heatproof film forms the nip section 36 with the heating unit 31 and the pressurization roller 32, as shown in drawing 2, it heats and pressurizes record sheet S ****(ed) by this nip section 36, and fixes the image on this sheet.

[0003] In this equipment, the nip section downstream of the stay 33 of the heating unit 31 was equipped with the inflection section of the shape of a semicircle which comes to continue crosswise [of record sheet S], and record sheet S which passed the nip section by enlarging the curvature of the thin heatproof film 34 partially is separated from the thin heatproof film 34. Moreover, in order to prevent that a user touches the heating unit 31 and the pressurization roller 32 directly, it has the fixing assembly covering 35.

[0004] As conventionally shown in drawing 3, when the jam was generated by a certain cause and record sheet S changed into the accordion condition within the fixing assembly covering 35, the place to go to by the side of the back end of record sheet S might be narrowed, while separation of record sheet S and the thin heatproof film 34 becomes impossible and the thin heatproof film 34 and record sheet S had stuck through the toner, the thin heatproof film 34 might rotate, and record sheet S might enter into the nip section 36 again. Then, the back end of record sheet S and the portion which entered into the nip section 36 again paste up with a toner like drawing 4, and jam processing becomes very difficult.

[0005] Therefore, the crevice t between the walls of the downstream of the heating unit 31 and the downstream of the fixing assembly covering 35 was narrowed, and it has prevented with [to the thin heatproof film 34 of record sheet S] a volume.

[0006]

[Problem(s) to be Solved by the Invention] However, it is in the orientation which the thin heatproof film 34 and record sheet S will stop being able to separate easily if the printing concentration on record sheet S becomes high. Even if it narrowed and has prevented the contamination of record sheet S until it touches the crevice t between the thin heatproof film 34 and the fixing assembly covering 35 It might escape in the direction in which the thin heatproof film 34 makes fixing assembly covering and a crevice like drawing 5, record sheet S might pass through Crevice t, and it might paste up in the shape of a loop like drawing 10.

[0007] It is made in order to solve the above-mentioned problem, and record material prevents Lycium chinense with a volume on a film, and this invention aims at offer of the image heating apparatus which could be made to carry out jam processing easily, and image formation equipment.

[0008]

[Means for Solving the Problem] Image heating apparatus and image formation equipment of this invention are characterized by the following configuration, in order to solve the above-mentioned technical problem.

[0009] [1]: A heating unit which is supported by stay and heats record material through a film of the shape of a pivotable cylinder, In image heating apparatus which heat-treats an image on record material by having a pressurization member which forms this heating unit and the nip section and pressurizes record material, pinching record material in this nip section, and making it convey with rotation of a film Image heating apparatus characterized by constituting so

that it may become while an angle of a tangent of this film and this separation side which used an intersection with a film at the time of having a separation pawl near the film of the film hand-of-cut downstream, and extending a separation side of this separation pawl rather than said nip section as a contact to make is 0 degree - 60 degrees.

[0010] [2]: Image heating apparatus given in [1] characterized by a separation side of said separation pawl being a field made to guide and separate in the direction which contacts a film with ***** material in the beginning with a volume, and estranges this record material from this film.

[0011] [3]: [1] characterized by having prepared the separation inflection section in the film hand-of-cut downstream of said nip section, and having arranged said separation pawl to the downstream rather than this inflection section, or image heating apparatus given in [2].

[0012] [4]: [1] characterized by having prepared the separation inflection section in the film hand-of-cut downstream of said nip section, having prepared the secondary segregation inflection section in the downstream rather than this inflection section, and having arranged said separation pawl to the downstream of this secondary segregation inflection section, or image heating apparatus given in [2].

[0013] [5]: A heating unit which is supported by stay and heats record material through a film of the shape of a pivotable cylinder, In image heating apparatus which heat-treats an image on record material by having a pressurization member which forms this heating unit and the nip section and pressurizes record material, pinching record material in this nip section, and making it convey with rotation of a film Image heating apparatus characterized by constituting so that it may become while an angle of a tangent of this film and this separation side which used as a contact a portion to which it had a separation pawl which touched a film by the film hand-of-cut downstream, and a film is in contact with this separation pawl from said nip section to make is 0 degree - 60 degrees.

[0014] [6]: Image heating apparatus given in [5] characterized by a separation side of said separation pawl being a field made to guide and separate in the direction which contacts a film with ***** material in the beginning with a volume, and estranges this record material from a film.

[0015] [7]: [5] characterized by having prepared the separation inflection section in the film hand-of-cut downstream of said nip section, and having arranged said separation pawl to the downstream rather than this inflection section, or image heating apparatus given in [6].

[0016] [8]: [5] characterized by having prepared the separation inflection section in the film hand-of-cut downstream of said nip section, having prepared the secondary segregation inflection section in the downstream rather than this inflection section, and having arranged said separation pawl to the downstream of this secondary segregation inflection section, or image heating apparatus given in [6].

[0017] [9]: Image heating apparatus given in any 1 term of [5] thru/or [8] characterized by said separation pawl being in contact with a film by fixed force with a self-weight or an elastic member.

[0018] [10]: Image heating apparatus given in any 1 term of [5] thru/or [9] characterized by said separation pawl having contacted on the sag section of said film.

[0019] [11]: Image heating apparatus given in any 1 term of [1] thru/or [10] characterized by said heat-treatment being the processing which makes this record material carry out heat fixing of the image on record material.

[0020] [12]: Image formation equipment characterized by equipping any 1 term of [1] thru/or [11] with image heating apparatus of a publication as an image heating means in image formation equipment which has an image formation means to form an image on record material, and an image heating means to heat an image on this record material.

[0021] <** **> by having arranged a separation pawl so that it may become as mentioned above while an angle with a tangent of a film in an intersection of a separation side, and this production and film or a contact of a separation pawl and a film to make is 0 degree - 60 degrees Without making a thin heatproof film produce a blemish and too much wear, since it can dissociate without not applying ***** material to a film but applying force to this film in the beginning with a volume, it prevents with [to a film of record material] a volume, and it becomes possible to perform jam processing easily.

[0022]

[Embodiment of the Invention] <1st operation gestalt> The image formation equipment which equipped the image heating apparatus and this which applied this invention to below with reference to the drawing as a fixing assembly is explained. Drawing 1 is type section drawing showing the outline configuration of the electro photographic printer as this image formation equipment.

[0023] First, the outline configuration of an electro photographic printer is explained with reference to drawing 1 . As shown in drawing 1 , an electro photographic printer 1 performs homogeneity electrification of the photoconductor drum 2 surface using the electrification roller 5. Next, by the laser scanner 3, laser beam L is irradiated through a mirror 4 on a photoconductor drum, image exposure of the purpose image is carried out, and a latent image is formed.

[0024] Next, the above-mentioned latent image is developed by giving the toner 8 in a development counter 6 through a developing roller 7 on a photoconductor drum side, and it considers as a toner image. On the other hand, it feeds paper at a time to one record sheet (record material) S loaded into the medium tray 13 with the feed roller 12 and a separation pad -- having -- a conveyance roller pair -- it is sent to 11. record sheet S -- a conveyance roller pair -- it is sent to the opposite section (imprint nip section) of the imprint roller 10 and a photoconductor drum 2 from 11, imprint bias is impressed from the imprint roller 10, and the toner image on a photoconductor drum side is imprinted on record sheet S. the toner 8 transferred to record sheet S is established by the fixing assembly 16 -- having -- record sheet S -- a delivery roller pair -- it is discharged by 17 out of an electro photographic printer main part. On the other hand, the toner 8 which remains after an imprint is cleaned with a cleaner 9, and a photoconductor drum 2 shifts to the process of the next step.

[0025] Next, a fixing assembly portion is explained. Drawing 5 is type section drawing of the fixing section of this example of an operation gestalt of this invention. Among this drawing, the plane heater (this example ceramic heater) at which H generates heat by energization, the cylinder-like thin heatproof film with which 34 ****s at this heater H, and 33 are supporter material (stay) which supports the thin heatproof film 34 pivotable while they place a heating surface upside down and support this heater H, and they constitute the heating unit 31 of this example by these elements H, and 33 and 34. Moreover, 32 is a pressurization member (pressurization roller) which carries out a pressure welding to this heating unit 31, and forms the nip section 36. It drives to a non-illustrated driving means, a rotation drive is carried out at the counterclockwise rotation of **** a, and this pressurization roller 32 makes a film 34 follow in the direction of **** a' in connection with this.

[0026] It **, and if record sheet S in which the toner image was formed by the image formation means which consists of the above-mentioned photoconductor drum 2, a laser scanner 3, a development counter 6, and imprint roller 10 grade is introduced into the nip section 36, it will be conveyed by rotation of the pressurization roller 32, and heat fixing of the toner image is carried out with the heat and nip pressure through a film 34 from Heater H at record sheet S.

[0027] such a configuration -- setting -- a certain cause -- record sheet S -- a delivery roller pair -- if it is no longer previously conveyed from 17 -- the inside of the fixing assembly covering 35 -- and between delivery roller pair 17 and the nip sections 36, record sheet S becomes accordion-like, and goes, and the place to go to of record sheet S narrows. And if record sheet S is conveyed further, record sheet S and the thin heatproof film 34 will not be separated in the separation inflection section 37, but record sheet S sticks to the thin heatproof film 34 through a toner, and it is ***** in the beginning with a volume.

[0028] Then, you form the separation pawl 41 near the film of the film hand-of-cut downstream, and this separation side 41a is making it show around and dissociate in the direction which hits with **** record sheet with volume S, and estranges this record sheet S from a film 34 from the nip section 36 with this operation gestalt.

[0029] Separated record sheet S piles up in the pocket section of the separation pawl 41 and the fixing assembly covering 35 like drawing 6, since lost record sheet S will be in a still smaller accordion condition, and it is accumulated in the crevice between the heating unit 31 and the pressurization roller 32 or the conveyance space of record sheet S is lost, the thin heatproof film 34 slips, and conveyance of record sheet S stops.

[0030] Without touching the thin heatproof film 34, this separation pawl 41 is arranged so that it may become while the angle theta of Tangent m and separation side 41a which used as Contact o the intersection at the time of extending the thin heatproof film 34 and separation side 41a in the field which intersects perpendicularly with the axis of rotation of a film 34 (namely, inside of the drawing 5 space) to make is 0 degree - 60 degrees.

[0031] Moreover, near the thin heatproof film, the separation pawl 41 is arranged in crosswise [film] like [it is desirable and] drawing 9, and is arranged to four places one or more places.

[0032] According to this operation gestalt, as mentioned above by having arranged the separation pawl 41 so that it may become while the angle with the tangent m of the film 34 in the intersection o of separation side 41a, and this production and film 34 to make is 0 degree - 60 degrees Since it can dissociate without not applying ***** S to the thin heatproof film 34, but applying the force to this thin heatproof film 34 in the beginning with a volume, Without making the thin heatproof film 34 produce a blemish and too much wear, it prevents with [to the thin heatproof film 34 of record sheet S] a volume, and enables a user to perform jam processing as a procedure.

[0033] <2nd operation gestalt> The 2nd operation gestalt is explained based on drawing 7 below. Drawing 7 is type section drawing near the fixing assembly of the 2nd operation gestalt concerning this invention. Compared with the operation gestalt of the above-mentioned [this operation gestalt], it differs in that the separation pawl was formed in the downstream of the secondary segregation inflection section, and other configurations are the same. For this reason, **** was given to the same element and a part of explanation for the second time was omitted.

[0034] a certain cause -- record sheet S -- a delivery roller pair -- if it is no longer previously conveyed from 17 -- the inside of the fixing assembly covering 35 -- and between delivery roller pair 17 and the nip sections 36, record sheet S

becomes accordion-like, and goes from delivery roller pair 17 side, and the place to go to of record sheet S narrows. Furthermore, when record sheet S is conveyed, the thin heatproof film 34 is supported, and record sheet S and the thin heatproof film 34 are not separated in the separation inflection section 37 of the thin heatproof film 34 which the inflection section of the shape of a semicircle which comes to follow the nip section 36 downstream of the stay 33 which has regulated the configuration in the paper width direction comes to regulate, but record sheet S sticks to the thin heatproof film 34 through a toner, and it is ***** in the beginning with a volume.

[0035] So, with this operation gestalt, support the thin heatproof film 34 and the secondary segregation inflection section 38 of the thin heatproof film 34 which the secondary inflection sections of the shape of a semicircle which comes to follow the stay 33 which has regulated the configuration in the paper width direction come to regulate is formed in the film hand-of-cut downstream of said separation inflection section 37. It is begun to make it dissociate from the thin heatproof film 34, and this separation pawl 41 further arranged to the downstream is made to separate completely record sheet S which has passed this separation inflection section 37. Separated record sheet S piles up in a separation claw part like drawing 8, since lost record sheet S will be in a still smaller accordion condition, and it is accumulated in the crevice between the heating unit 31 and the pressurization roller 32 or the conveyance space of record sheet S is lost, the thin heatproof film 34 slips, and conveyance of record sheet S stops.

[0036] Without the separation pawl 41 touching the thin heatproof film 34 also in this operation gestalt, it is arranged so that it may become while the angle theta of Tangent m and separation side 41a of the separation pawl 41 which used the intersection at the time of extending the thin heatproof film 34 and separation side 41a as the contact to make is 0 degree - 60 degrees. Moreover, two or more separation pawls 41 are arranged on the thin heatproof film.

[0037] According to this operation gestalt, as mentioned above by having made the thin heatproof film 34 approach the downstream of the secondary segregation inflection section, having formed the separation pawl 41, and having constituted so that it might become while the angle of separation side 41a of this separation pawl 41 and Tangent m to make is 0 degree - 60 degrees. Without making the thin heatproof film 34 produce a blemish and too much wear, since it is not necessary to apply the force to the thin heatproof film 34, ***** S can be certainly divided into the thin heatproof film 34 in the beginning with a volume, and it enables a user to perform jam processing as a procedure.

[0038] <3rd operation gestalt> The 3rd operation gestalt is explained based on drawing 11 below. Drawing 11 is type section drawing near the fixing assembly of the 3rd operation gestalt concerning this invention. Compared with the operation gestalt of the above-mentioned [this operation gestalt], it differs in that the separation pawl was made to contact the sag section of a film, and other configurations are the same. For this reason, ***** was given to the same element and a part of explanation for the second time was omitted.

[0039] a certain cause -- record sheet S -- a delivery roller pair -- if it is no longer previously conveyed from 17 -- the inside of the fixing assembly covering 35 -- and between delivery roller pair 17 and the nip sections 36, record sheet S becomes accordion-like, and goes from delivery roller pair 17 side, and the place to go to of record sheet S narrows. Furthermore, when record sheet S is conveyed, the thin heatproof film 34 is supported, and record sheet S and the thin heatproof film 34 are not separated in the separation inflection section 37 of the thin heatproof film 34 which the inflection section of the shape of a semicircle which comes to follow the nip section 36 downstream of the stay 33 which has regulated the configuration in the paper width direction comes to regulate, but record sheet S sticks to the thin heatproof film 34 through a toner, and it is ***** in the beginning with a volume.

[0040] ***** S touches a sag portion (portion in which the film 34 has floated from the stay 33) with the stay 33 of the thin heatproof film 34 by 5 or more g/cm of contact force in the beginning with a volume. And it sets in the field which intersects perpendicularly with the film axis of rotation (namely, inside of the drawing 11 space). The thin heatproof film 34 and record sheet S are separated by the separation pawl 41 arranged while the angle theta of the tangent m of a film 34 and separation side 41a which used as Contact o the portion to which the thin heatproof film 34 is in contact with the separation pawl tip to make was 0 degree - 60 degrees. As for separated record sheet S, record sheet S piles up in the pocket section of the separation pawl 41 and the fixing assembly covering 35 like drawing 12, since lost record sheet S will be in a still smaller accordion condition, and it is accumulated in the crevice between the heating unit 31 and the pressurization roller 32 or the conveyance space of record sheet S is lost, the thin heatproof film 34 slips, and conveyance of record sheet S stops.

[0041] In addition, on a thin heatproof film, one or more places, the separation pawl 41 is preferably put in order in the direction of the film axis of rotation, and is arranged at two or more places.

[0042] According to this example, the separation pawl 41 touches by 5 or more g/cm of contact force on the sag portion of the thin heatproof film 34 as mentioned above. Since it is not necessary to apply the force with the thin heatproof film 34 impossible for by having arranged this separation pawl 41 so that it may become while the angle of Tangent m and separation side 41a of the separation pawl 41 in this contact o to make is 0 degree - 60 degrees, Without making this

thin heatproof film 34 produce a blemish and too much wear, it prevents with [of record sheet S to the thin heatproof film 34] a volume, and enables a user to perform jam processing as a procedure.

[0043]

[Effect of the Invention] As explained above, according to this invention, record material can prevent *Lycium chinense* with a volume on a film, and the image heating apparatus and image formation equipment which could be made to carry out jam processing easily can be offered.

[Translation done.]

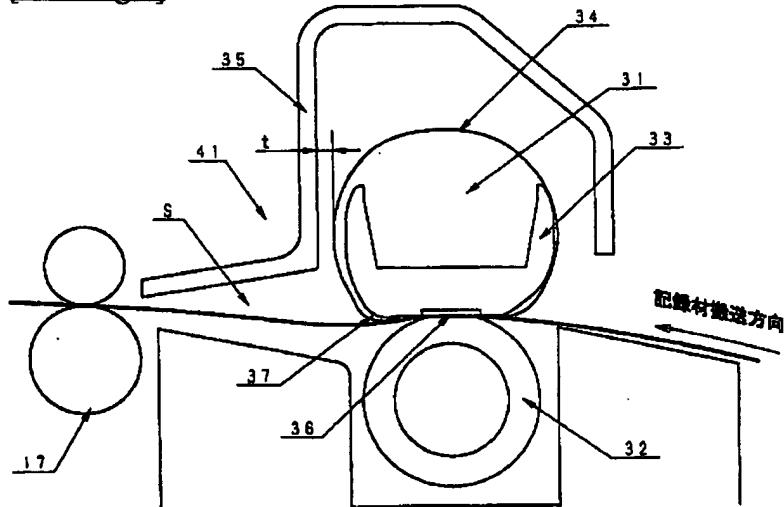
* NOTICES *

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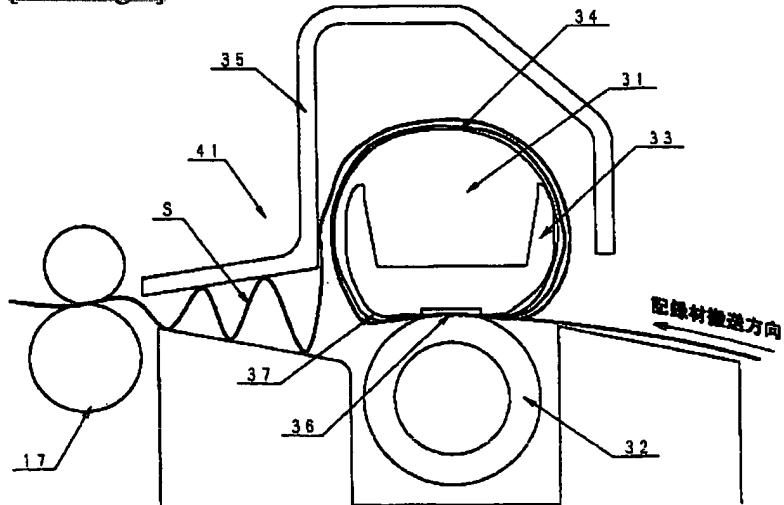
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2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DRAWINGS

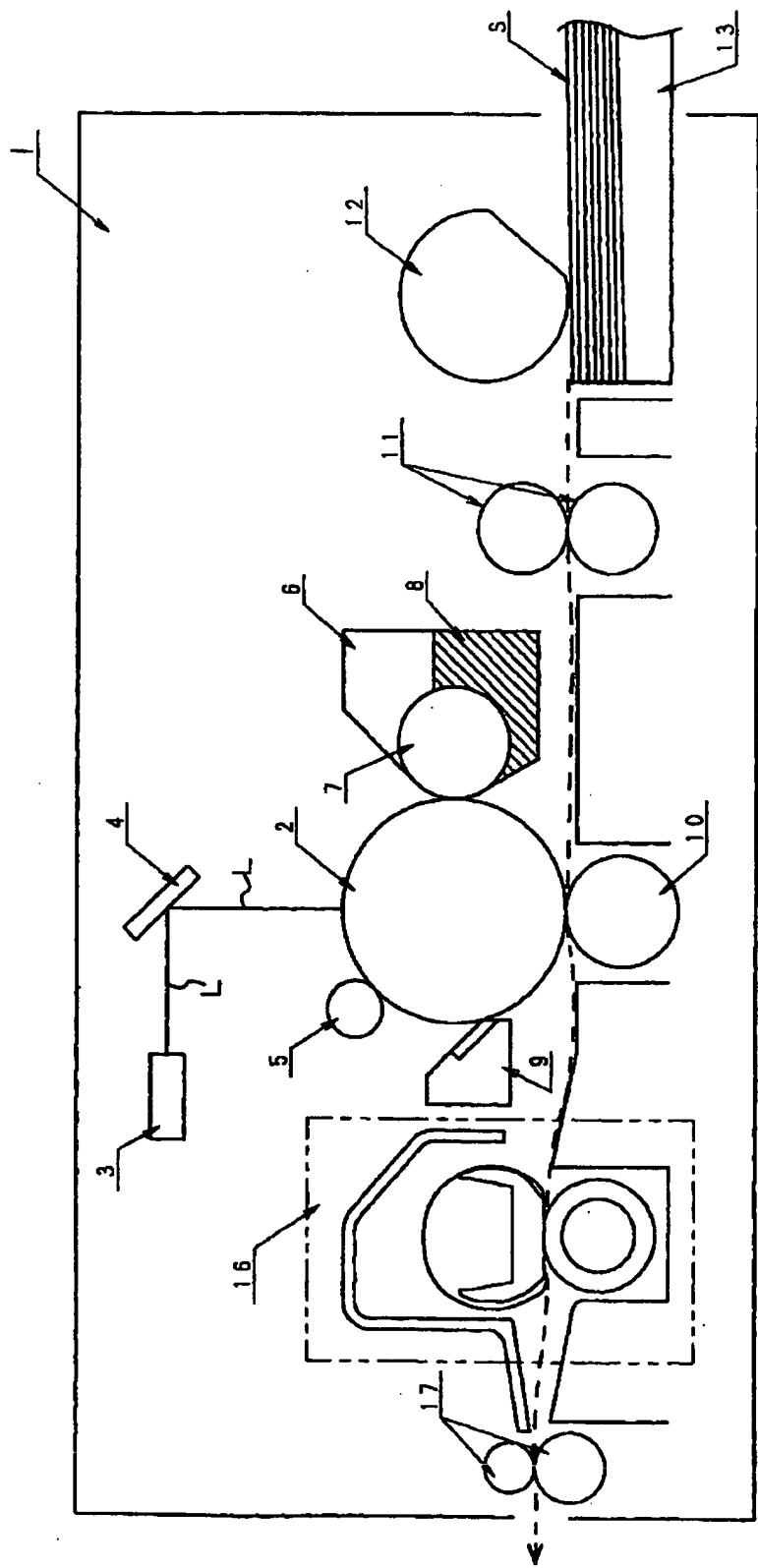
[Drawing 2]



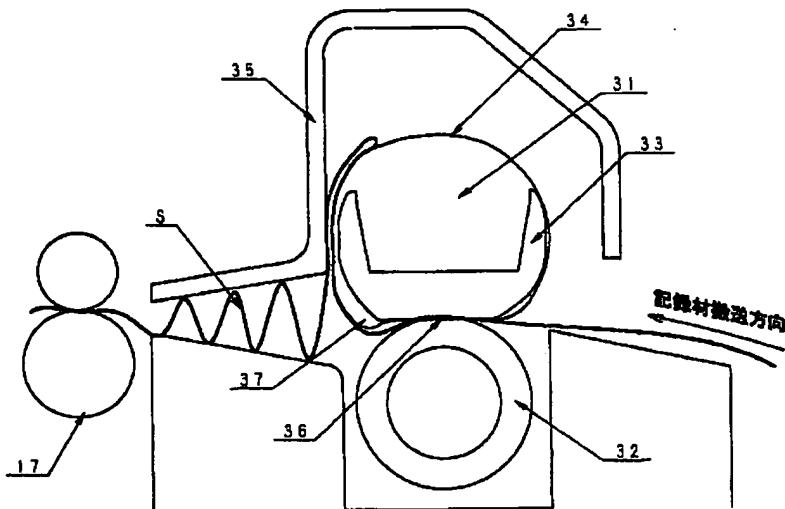
[Drawing 3]



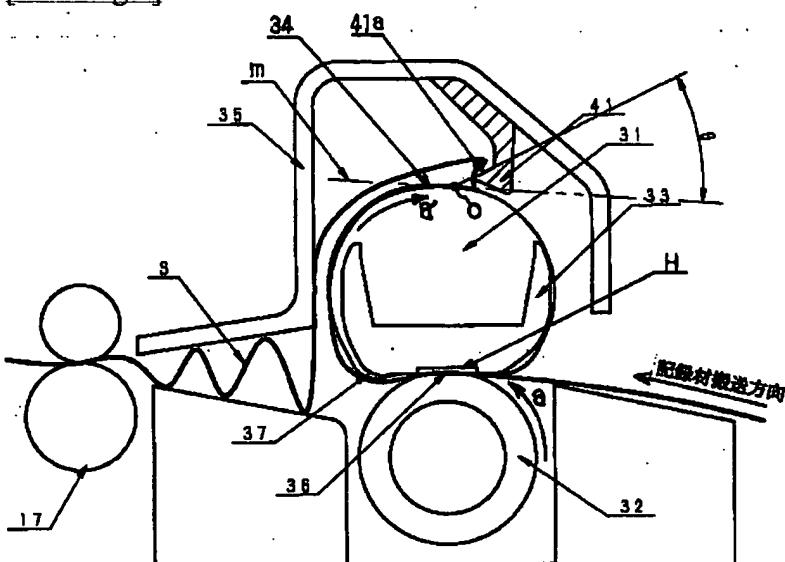
[Drawing 1]



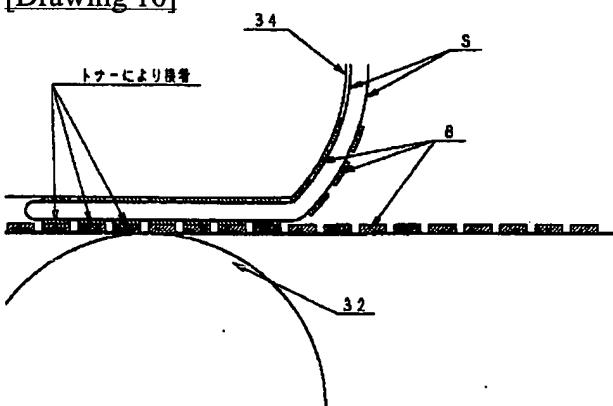
[Drawing 4]



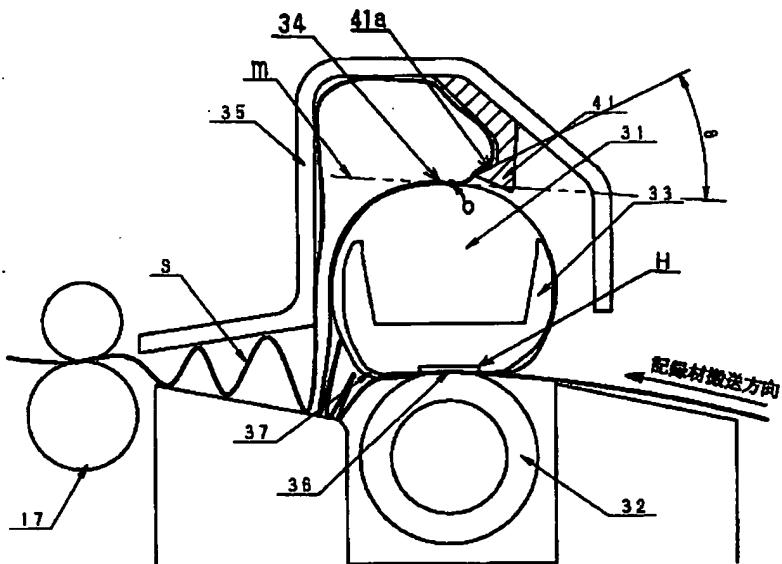
[Drawing 5]



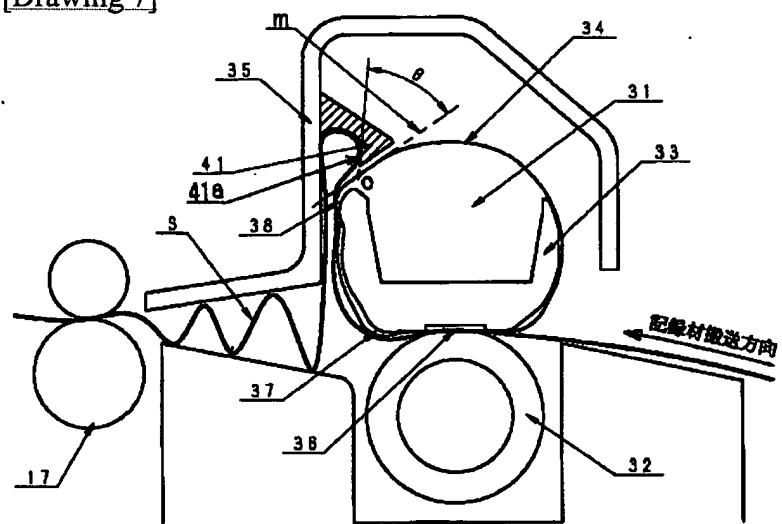
[Drawing 10]



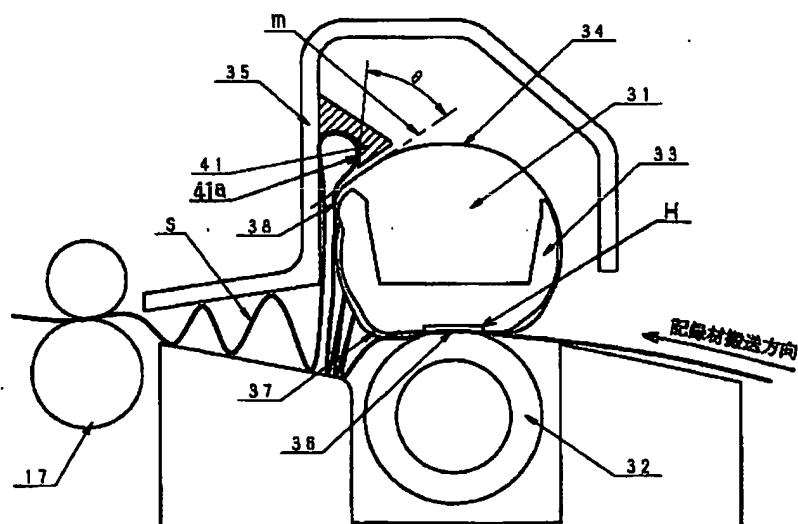
[Drawing 6]



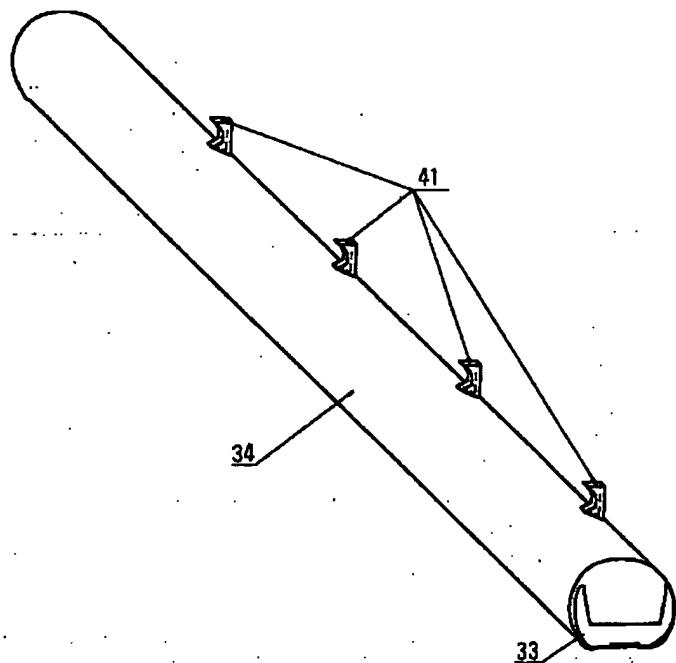
[Drawing 7]



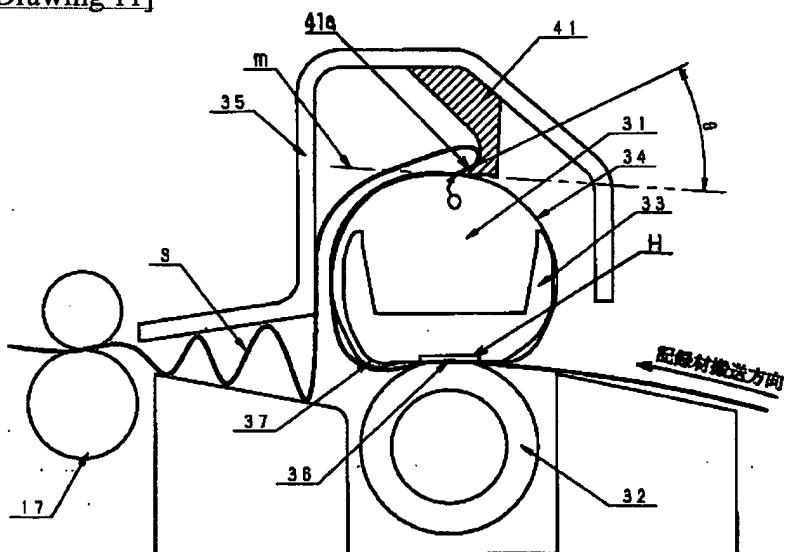
[Drawing 8]



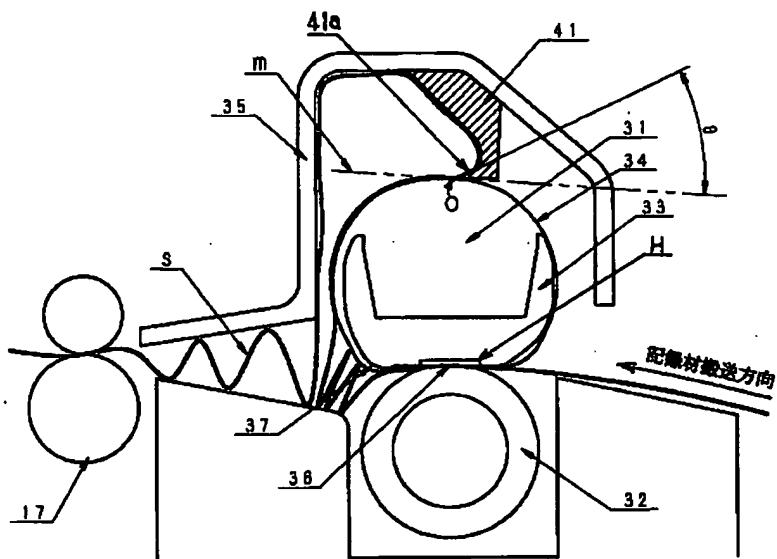
[Drawing 9]



[Drawing 11]



[Drawing 12]



[Translation done.]